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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/890,282	08/10/2001	Frank Meyer	211586US0PCT	3451

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EXAMINER

SADULA, JENNIFER R

ART UNIT PAPER NUMBER

1756

DATE MAILED: 02/05/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/890,282

Applicant(s)

MEYER ET AL.

Examiner

Jennifer R. Sadula

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-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 8/10/2001, 11/7/01, 3/14/02.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 19-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 19-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 11/7/01 has been considered by the examiner. However, the examiner wishes to note that these references merely submitted with English translations of an abstract have only been considered on the merits of that which was in English and no more. Those references submitted without an English abstract were considered only on the basis of the figures.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

The 6th paragraph on page 13 appears to contain some problematic phraseology that may be due to a rough translation of the specification. Further, the specification fails to contain a written description of what the Applicants define as "light, heat and/or oxidation stabilizers". Appropriate correction is required.

Claim Objections

Claim 19 is objected to because of the following informalities: it is unclear how Z^1-Z^4 are polymerizable groups, Y^1-Y^8 are as specified, however Z^1-Y^1 , Z^2-Y^2 , Z^3-Y^5 and (if present) Z^4-Y^6 can then be either methacryloyloxy, acryloyloxy, or vinyloxy. It appears the Applicants

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would better claim Y¹, Y², Y⁵, and Y⁶ as a separate set of variables than the set of Y³, Y⁴, Y⁷, and Y⁸. Further, when the Applicants define Y⁹ and Y¹⁰ as the “bridging units as defined for Y¹ to Y⁸”, it would be appropriate for the Applicants to properly define initially the groupings Y¹ to Y⁸ as “bridging units”. Particularly applicable because later in the claim the Applicants state that Y¹¹ to Y¹³ are merely “bridging units” and such should be defined. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 19-37 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Beginning on page 34 of the specification the Applicants note “examples which may be mentioned of light, heat and/or oxidation stabilizers as component E)...” however the Applicants never define what is encompassed by the limitation in claim 19 of “further additives selected from the group consisting of light, heat and/or oxidation stabilizers” – only examples of what might be considered. Appropriate correction is required.

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The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 19-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 19 the Applicants claim a composition comprising the liquid crystalline mixture (A), further additives selected from the group B, and potential additional additives C and/or D and/or E. If the Applicants intend to claim the addition of potential additional additives C and/or D and/or E in claim 19, then claim 20 does not further limit claim from which it depends.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 19-37 are rejected under 35 U.S.C. 102(b) as being anticipated by Beck et al., U.S. Patent No. 5,798,147 ("Beck").

Beck discloses a process for coating and printing substrates wherein the coating or printing composition comprises a polymerizable liquid crystalline material and a chiral monomer

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(LC or non-LC) which is applied to a substrate (abstract). Formula I at the top of column 3 of Beck is the exact formula for the liquid crystalline materials sought by applicants. Furthermore the chiral additive of A2 is depicted in formula III of column 10 wherein the chiral compound preferably carries at least one polymerizable group in addition to the two maintained by the liquid crystal component. The variety of applications begin in column 15 and include sheet-like coatings. The viscosity is within the range of the claimed composition and additional polymeric binders, adhesion promoters, photoinitiators, UV and weathering stabilizers are all listed beginning in column 15, line 28. All conventional printing processes are anticipated (18:18-28) and the reflection range can be adjusted from infrared to ultra-violet light. Furthermore the novel printing inks may be used to produce marks and security inscriptions invisible to the human eye and therefore useful in anti-counterfeiting markets (18:29-33; 20:55-58).

Additional compositions are taught dependent upon the intended use (18:34-20:25). The liquid crystal makes up 20-95% by weight.

Claims 19-21, 23-24, 26-31, and 33-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Parri et al., U.S. Patent No. 6,217,792 ("Parri").

Parri discloses chiral dopants copolymerized with liquid crystalline materials wherein the chiral dopant materials match the chiral compounds as taught by the Applicants specification page 50 wherein G is the chiral bivalent structure as shown, MG^1 and MG^2 are both 1,4 - phenylene groups, X^1 and X^2 are both either a single bond or oxygen and the R groups are as the R radicals as shown (see Parri columns 7-8 for specific example of such).

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The liquid crystalline component of Parri is taught to be a polymerizable liquid crystal $R'-L'-G'-E-R^*$, or more preferably $P-(Sp-X)_n-A-Z^1-B-(Z^2-C)_p-R^3$ (column 11) wherein the P and the R^3 groups are polymerizable groups such as methacryloyloxy, acryloyloxy or vinyloxy. As noted in the examples of columns 11-12, the main liquid crystalline materials of Parri match the Applicants mixtures M2 exactly (see specifically first Parri sample compound).

In accordance with the examples of Parri, the chiral component is added in an amount of between 3.5-11% by weight to the liquid crystal materials. In accordance with the claims the material is from 0.001 to 15% by weight. As noted in claim 16 of Parri the material may further comprise at least one catalyst, sensitizer, stabilizer, co-reacting monomer or a surface-active compound. The "co-reacting monomers" encompass photoinitiators, as do the category of "catalysts". The viscosity falls within the range as claimed (see example 1). The compound may be used for coating substrates and for electro-optical elements, color filters, or displays (claim 9-10 and 1:57-67). The compound will selectively reflect light within the range as specified by Applicants claim 26 (see examples). It is inherent to the teaching of Parri that the substrate may indeed be precoated in one or more colors, as applicable in accordance with the uses as specified by Parri.

Claims 19-20, 22-30, 32, and 34-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Poetsch et al., U.S. Patent No. 6,291,065 ("Poetsch").

Poetsch teaches pigment flakes having a chiral liquid crystalline polymeric material which serves as either a carrier or coating composition in paints, printing inks, colored plastics, electro-optical devices and security applications (abstract). The chiral polymerizable material is

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as shown in formula I* wherein the liquid crystalline material is shown in formula I. The R end units may be further polymerizable as they may be substituted with P-(Sp-X)_n units. The mesogenic group of the liquid crystalline material is preferably formula II in column 11 and, as shown in column 16, coordinates by exemplification with the claimed embodiments of the present application. The composition as a whole may further include a photoinitiator and optionally non-mesogenic compounds having two or more polymerizable functional groups (column 29). Accompanying filler materials may be added.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 22, 25, 32 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parri as applied above, in view of Beck.

Parri discloses chiral dopants copolymerized with liquid crystalline materials wherein the chiral dopant materials match the chiral compounds as taught by the Applicants specification page 50 wherein G is the chiral bivalent structure as shown, MG¹ and MG² are both 1,4 – phenylene groups, X¹ and X² are both either a single bond or oxygen and the R groups are as the R radicals as shown (see Parri columns 7-8 for specific example of such). In accordance with the claims the material is from 0.001 to 15% by weight and the viscosity falls within the range as claimed (see example 1). The compound may be used for coating substrates and for electro-

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optical elements, color filters, or displays (claim 9-10 and 1:57-67). The compound will selectively reflect light within the range as specified by Applicants claim 26 (see examples). However, Parri does not teach the use of the materials for printing inks or anticounterfeiting.

Beck discloses a process for coating and printing substrates wherein the coating or printing composition comprises a polymerizable liquid crystalline material and a chiral monomer (LC or non-LC) which is applied to a substrate (abstract). The formulation is similar to that of Parri and the variety of applications begin in column 15 and include sheet-like coatings. Furthermore the novel printing inks may be used to produce marks and security inscriptions invisible to the human eye and therefore useful in anti-counterfeiting markets (18:29-33; 20:55-58).

It would have been obvious to one of ordinary skill in the art at the time of invention to use the novel compositions of Parri for the printing and anticounterfeiting purposes of Beck as Beck discloses similar compositions dependent upon the same additives for additional purposes and such additional markets (such as printing and anticounterfeiting) increase the marketability of such a product.

Claims 21 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poetsch as applied above.

Poetsch teaches pigment flakes having a chiral liquid crystalline polymeric material which serves as either a carrier or coating composition in paints, printing inks, colored plastics, electro-optical devices and security applications (abstract). The chiral polymerizable material is as shown in formula I* wherein the liquid crystalline material is shown in formula I. The R end

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units may be further polymerizable as they may be substituted with $P-(Sp-X)_n$ units. However, Poetsch does not teach the specified viscosity or precoated substrate.

Poetsch does, however, teach substantially similar compositions as those disclosed by the Applicants and it would have been obvious to one of ordinary skill in the art at the time of invention to comprehend such components as both having such a desired reflective range and to be capable of coating on to a precoated colored substrate as the reflectivity is desirable to be visible to the naked eye and the substrate is desirable when the materials would be used as a paint or coloring composition as Poetsch discloses.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A) Verrall et al. teaches a polymer film containing a liquid crystalline material and a chiral additive for the purposes of printing and dying materials.

B) Meyer et al. teaches the polymerizable liquid crystalline compounds as disclosed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer R. Sadula whose telephone number is 703.305.4835.

The examiner can normally be reached on Monday through Friday, 10am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark F. Huff can be reached on 703.308.2464. The fax phone numbers for the

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organization where this application or proceeding is assigned are 703.872.9310 for regular communications and 703.872.9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

A handwritten signature in black ink, appearing to read 'Mark F. Huff', is written over a rectangular stamp.

**MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700**

JRS
January 24, 2003